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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,411	04/02/2001	Naohito Hanai	108692	5073

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EXAMINER

SANTIAGO, ENRIQUE L

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 12/19/2003

*4*

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/763,411

Applicant(s)

HANAI ET AL.

Examiner

Enrique L. Santiago

Art Unit

2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1. 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Colwell US patent no. 5,877,777.

-Regarding claim 1 Colwell teaches an image generation system which generates an image of an object formed by a primitive surface (see figs. 1, 6 and 14, column 4, lines 13-28): impact computation means which computes an impact position at which an impact is imparted to the object (see fig. 12, column 3, lines 30-44); distortion computation means which performs computations for causing the distortion of the primitive surface in the vicinity of the impact position (see figs. 12 and 14, column 11, lines 22-32); and image generation means which generates an image of the object formed by the primitive surface that has been distorted after the impact was imparted to the object (see figs. 1, 6 and 14, column 11, lines 22-32).

-Regarding claim 15, Colwell in addition to the limitations of claim 1, further teaches a computer-usable program embodied on an information storage medium or in a carrier wave, in which is stored information for controlling an image generation system which generates an image of an object formed by a primitive surface (see column 3, lines 8-38, column 9, lines 56-67, column 10, lines 22-28).

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-4 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colwell US patent no. 5,877,777 in view of Gagne et al. US patent no. 5,731,819.

-Regarding claims 2 and 16, although Colwell teaches the effect of an object impacting a surface and the wire-frame response, it does not specifically teach the limitations of claims 2 and 16.

However in similar art Gagne et al. teaches a method including: point-to-be-moved determination means which determine at least one surface-specifying point that is to be moved, based on the impact position (see column 6, lines 23-28), from among surface-specifying points that are distributed over the surface of the object or in the vicinity of the object for defining the primitive surface that forms the object (see column 6, lines 23-28); means which computes at least one distortion point for specifying the shape of the primitive surface that is distorted by an impact (see figs. 3 and 4, column 6, lines 23-28); and means which causes the position of the thus-determined surface-specifying point to move to the distortion point (see figs. 3 and 4, column 6, lines 23-28); and wherein the image generation means specifies the primitive surface based on the surface-specifying point that has been moved and generates an image (see figs. 3 and 4, column 5, lines 47-49, column 6, lines 23-28).

Art Unit: 2671

Therefore it would have been obvious to one skilled in the art at the time of the invention to use said method, because it would make the reaction and appearance of an object after being hit more realistic, or could alternatively be set to a more extreme level suitable for cartoon animations (see Gagne et al., column 6, lines 27-40).

-Regarding claims 3 and 17, Colwell teaches an image generation system wherein the impact computation means further comprises means which calculates the magnitude and direction of the impact imparted to the object (see fig. 12, column 10, lines 11-50); and wherein the distortion point is calculated from at least one of the impact position and the magnitude and direction of the impact (see fig. 12, column 10, lines 11-50).

-Regarding claims 4 and 18, Colwell further teaches an image generation system wherein the wire-frame mesh defining a two-dimensional regular array of adjacent volumetric fluid cells are distributed in a predetermined density (see column 9, lines 10-11, column 10, lines 4-7), which is equivalent to the surface-specifying points being distributed in a predetermined density.

Claim 5-9, 12, 19-23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colwell US patent no. 5,877,777 in view of Gagne et al. US patent no. 5,731,819 and further in view of Deering et al., US patent no. 6,417,861 B1.

-Regarding claims 5 and 19, Colwell and Gagne et al. do not directly teach an image generation system wherein the surface-specifying points are distributed in an arrangement that deviates in a random manner from grid points. However in similar art Deering et al. teaches said system (see column 6, lines 14-16, column 17, lines 6-52).

Therefore it would have been obvious to one skilled in the art at the time of the invention to use said system, because it may potentially reduce visual artifacts and improve the realism of the image displayed (Deering et al., column 3, lines 50-53).

-Regarding claims 6 and 20, Colwell further teaches an image generation system wherein the density of distribution of the surface specifying points is adjusted in accordance with the magnitude of distortion of the object due to an impact (see column 4, lines 13-28, column 9, lines 10-15).

-Regarding Claims 7 and 21, Gagne et al. further teaches an image generation system wherein the point-to-be-moved determination means determines a surface-specifying point in the vicinity of the impact position as a point to be moved (see column 6, lines 23-28).

-Regarding claims 8 and 22, Gagne et al. further teaches an image generation system wherein the surface-specifying points are distributed in real-time after the object has been subjected to an impact (see column 6, lines 35-39 and 57-62).

-Regarding claims 9 and 23, Gagne et al. further teaches an image generation system at least one of the range and density of distribution of the surface-specifying points is determined in accordance with an impact that has been imparted to the object (see column 6, lines 23-40).

-Regarding claims 12 and 26, Deering et al. further teaches an image generation system wherein image generation is performed for an object formed by polygonal surfaces having the surface-specifying points as vertices (see column 14, lines 25-36).

Claims 10, 11, 13 24, 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colwell US patent no. 5,877,777 in view of Gagne et al. US patent no. 5,731,819 and further in view of Isowaki et al. US patent no. 6,417,861.

Art Unit: 2671

-Regarding claims 10 and 24, Colwell and Gagne et al. do not directly teach an image generation system comprising texture mapping computation means which performs computations necessary for mapping a texture onto the primitive surface that has been distorted by an impact; wherein the texture mapping computation means performs texture mapping processing, using texture coordinates that corresponded to the surface-specifying point before movement, even when the surface-specifying point has been moved by an impact.

However in similar art Isowaki et al. teaches said system (see column 3, lines 1-10, column 12, lines 60-65, column 14, lines 61-67). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said method, because it would make it possible to reproduce changes on an object due to impact even when the changes are minimal (see Isowaki et al., column 15, lines 10-14), thus making it possible to render and display more realistic images (see Isowaki et al., column 1, lines 5-9).

-Regarding claims 11 and 25, Colwell and Gagne et al. do not directly teach an image generation system comprising texture mapping computation means which performs computations necessary for mapping a texture onto the primitive surface that has been distorted by an impact; wherein the texture mapping computation means comprises means which performs texture mapping processing, using texture coordinates which correspond to the impact position and are related to the surface-specifying point that has been moved by an impact.

However in similar art Isowaki et al. Teaches said system (see column 3, lines 1-10, column 12, lines 60-65, column 14, lines 61-67). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said method, because it would make it possible to reproduce changes on an object due to impact even when the changes are minimal

Art Unit: 2671

(see Isowaki et al., column 15, lines 10-14), therefore making it possible to render and display more realistic images (see Isowaki et al., column 1, lines 5-9).

-Regarding claims 13 and 27, Isowaki et al teaches an comprising: means which perform image generation by using a polygonal object having the surface-specifying points as vertices (see column 12, lines 54), and a shading process in the vicinity of the vertices after the vertices have been moved by an impact (see column 5, lines 1-17, column 14, lines 61-67). The previously stated art does not specifically teach shading in such a manner that the vicinity of the vertices after movement is darker. However it teaches that texture mapping of ordinary undamaged texture and damaged texture is performed on the polygons, and controlling the transparency parameters of both textures in accordance with the state of damage to the impacted portion.

Therefore it would have been obvious to one skilled in the art at the time the invention was made to shade in such a manner that the vicinity of the vertices after movement is darker (or lighter), because it would make it possible to render damage in accordance with the damage of the impacted portion.

Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isowaki et al. US patent no. 6,417,861 in view of Colwell US patent no. 5,877,777.

-Regarding claims 14 and 28, Isowaki et al. teaches an image generation system which generates an image of an object formed by a polygonal surface (see fig. 1, column 4, lines 14-19 and 56-61), the image generation system comprising: object information storage means which stores information on the object formed by the polygonal surface having vertices that are a plurality of points distributed over the surface of the object (see fig. 1, column 12, lines 48-52,



Art Unit: 2671

column 13, lines 11-34, 48-53); point-to-be-moved determination means that operates when an impact is imparted to the object, for determining at least one vertex to be moved, based on an imparted impact position (see figs. 22-24, column 13, line 35-column 14, line 67); means which causes the vertex to be moved to move, based on the magnitude and direction of the impact imparted to the object (see figs. 22-24, column 13, line 35-column 14, line 67); and image generation means which generates an image of the object after a distortion caused by the impact, using the vertex that has been moved (see column 13, line 35-column 14, line 67).

Isowaki et al. does not directly teach surface-specifying points being distributed in a predetermined density. However in similar art Colwell teaches an image generation system wherein the wire-frame mesh defining a two-dimensional regular array of adjacent volumetric fluid cells are distributed in a predetermined density (see column 9, lines 10-11, column 10, lines 4-7), which is equivalent to the surface-specifying points being distributed in a predetermined density. Therefore it would have been obvious to one skilled in the art at the time of the invention to use said system, because it would give the user a high degree of control over the parameters and enable said user to produce a wide variety of special effects (see Colwell, fig. 12, column 9, lines 6-18).

### **Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US patent no. 5,918,238

US patent no. 6,054,992

US patent no. 6,069,634

Art Unit: 2671

US patent no. 6,271,856 B1

US patent no. 6,456,289 B1

US patent no. 6,509,902 B1.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Enrique L. Santiago whose telephone number is (703) 306-5908.

The examiner can normally be reached on Monday to Friday from 7:00 A.M. to 3:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Enrique L. Santiago

December 5, 2003



MARK ZIMMERMAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600